

UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK

MASTR ADJUSTABLE RATE MORTGAGES  
TRUST 2006-OA2, MASTR ADJUSTABLE  
RATE MORTGAGES TRUST 2007-1, AND  
MASTR ADJUSTABLE RATE MORTGAGES  
TRUST 2007-3,

12 Civ. 7322 (PKC)

Plaintiffs,

-against-

UBS REAL ESTATE SECURITIES INC.,

Defendant.

**DECLARATION OF CHARLES D. COWAN IN OPPOSITION TO  
DEFENDANT'S MOTIONS *IN LIMINE* # 1-5**

I, Charles D. Cowan, submit this declaration pursuant to 28 U.S.C. § 1746 and declare as follows:

**I. Introduction**

1. I have been retained by Quinn Emanuel Urquhart & Sullivan, LLP (“Quinn Emanuel”), counsel for Plaintiffs MASTR Adjustable Rate Mortgages Trust 2006-OA2 (the “2006-OA2 Transaction”); MASTR Adjustable Rate Mortgages Trust 2007-1 (the “2007-1 Transaction”); and MASTR Adjustable Rate Mortgages Trust 2007-3 (the “2007-3 Transaction”) (collectively, the “Plaintiffs” ), to analyze data from an Automated Valuation Model (“AVM”) used to estimate the value of properties underlying the collateral in the loans at issue in Plaintiffs’ litigation against UBS Real Estate Securities Inc. (“UBS”) in the above-captioned action.

2. Quinn Emanuel commissioned two AVMs. The first was conducted by the firm Lewtan, and its results were provided to me as a final data file. I spoke with analysts at Lewtan

and obtained a complete description of their methodology and findings. At the request of Quinn Emanuel, I conducted a second analysis using information purchased from the firm Phoenix Advisors & Managers USA LLC (“Phoenix”). I met personally with analysts at Phoenix, I provided them with the methodology they used for selection of the information I used for my analysis, and using the file Phoenix provided to Quinn Emanuel, I conducted the AVM analysis in my second report.

3. Results of both analyses were provided in two separate reports. I submitted a report on the data from Lewtan on April 25, 2014 (“2014 Report”).<sup>1</sup> I submitted a report on the data provided by Phoenix on August 7, 2015 (“2015 Report”).<sup>2</sup> Both reports were provided to UBS. Following each report, I also made myself available for depositions, which were scheduled and subsequently cancelled by UBS less than two days before they were to take place. For the second, I went to New York City from South Texas and was present in the city when the deposition was cancelled.

4. On January 21, 2016, UBS filed a Motion *In Limine* to exclude my testimony. The motion makes a number of serious misstatements regarding my work in this matter and my qualifications, which are contradicted by the reports I submitted and my academic journal articles, clearly listed in my Curriculum Vitae (attached to both my 2014 Report and 2015 Report).

5. I have been accepted by the courts on the use of statistical analysis in cases similar to the above captioned case, as well as in numerous other cases involving the construction and use of my own AVMs. This information was also readily available to UBS as part of my disclosures

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<sup>1</sup> Before I submitted the 2014 Report, I submitted a report on February 21, 2014 and a corrected and supplemental report on March 19, 2014. All of these reports analyzed Lewtan data.

<sup>2</sup> I understand that the 2014 Report and the 2015 Report have been submitted as Exhibits 20 and 8, respectively, to the Declaration of Sean P. Baldwin in Opposition to Defendant’s Motions *In Limine* #1-5 (“Baldwin Decl.”).

on past testimony that were a part of both my 2014 Report and 2015 Report, but was either mischaracterized or ignored.

6. Thus, I discuss my experience and methodology below.

## **II. Experience**

7. As disclosed in my C.V., I am a member of the International Association of Assessing Officers (IAAO), which is the body of property tax assessors in the United States and throughout the world. 2015 Report Ex. 1 at 3. Almost all counties and other jurisdictions in the United States rely on AVMs to value properties for the purpose of assessing taxes.

8. The IAAO was formed in 1934 to promote consistency and standards for property appraisals. AVM standards are published by the IAAO, as well as books on the methods used for conducting AVMs and course material used for training in the development and application of AVMs. The IAAO also hosts an annual conference on property appraisal methods and AVMs.

9. Also as disclosed in my C.V., I gave a paper at the annual conference of the IAAO, entitled “Use of Mass Appraisals in Toxic Tort Litigation Involving Loss of Value” in Proceedings of the International Association of Assessing Officers, October 2002. 2015 Report Ex. 1 at 7.

10. I have constructed my own AVMs in situations that require the use of a statistical model to prove or disprove a claim, including in numerous legal cases where a claim of diminution of value was made because of an environmental “disamenity,” the polite term for a toxic spill, leak, or explosion. My C.V. lists these types of cases, requiring the use of AVMs that I constructed, including *Bawtinheimer v. D.R. Horton, Inc.* and *Parko et al. v. Shell Oil et al.* 2015 Report Ex. 2 at 3.

11. I have also constructed my own AVMs in cases involving disparate impact claims. My C.V. lists these cases as well. These cases include *Webb Bridge LLC v. City of Alpharetta et al.* and *Causeway Landings LTD et al. v. City of New Smyrna Beach*. 2015 Report Ex. 2 at 3. Since the submission of the 2015 Report, I have performed similar work in *Denton Cove, Ltd. et al. v. City of Apalachicola, FL and School Board of Franklin Co., FL* and *BBC Baymeadows, LLC v. City of Ridgeland, MS*.

12. As further disclosed in the 2015 Report, I was qualified as an expert in *CMFG Life Insurance Co. v. RBS Securities Inc.* relating to AVMs. 2015 Report at ¶ 10. UBS incorrectly claims that in *CMFG*, unlike here, “the plaintiff disclosed the entity that generated the AVMs under Federal Rule of Civil Procedure 26 and the defendant had the opportunity to depose that entity’s corporate representative.”<sup>3</sup> To the contrary, I disclosed Lewtan in my 2014 Report and Phoenix in my 2015 Report.

13. UBS also states that the *CMFG* court explained that “Dr. Cowan certainly cannot opine that the AVM outputs themselves are correct; he lacks the qualifications to offer such an opinion.”<sup>4</sup> This is misleading. In *CMFG*, I used a commercially available AVM that the defendants in that case also used. I was not offered as an expert in that AVM, but rather only as an expert in statistical analysis of AVMs. Here, by contrast, I dictated both the method of comparable selection and the attendant analysis. I gave Phoenix the method to find the ten closest comparable properties, based on two published articles I wrote. 2015 Report at ¶ 5 & n.3. Phoenix did no statistical analysis that I relied on—all the analysis presented in my report is

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<sup>3</sup> UBS Real Estate Securities Inc.’s Memorandum of Law in Support of Its Motion *In Limine* No. 4 to Exclude the Expert Testimony of Dr. Charles D. Cowan (“Motion *In Limine*”), page 18.

<sup>4</sup> Motion *In Limine*, page 19.

mine.<sup>5</sup> UBS acknowledges that I am qualified to conduct a statistical analysis and to draw conclusions based on that analysis.<sup>6</sup> I am also qualified to prepare and offer a matching methodology such as the use of “Mahalanobis” distances (as used by Phoenix, at my direction, and discussed in more detail below), because I am the one who developed and published such a method for use at the Census Bureau.

### III. What Is An AVM?

14. An AVM is an Automated Valuation Model—an econometric methodology to determine the value of masses of houses, with the requirement that the average predicted value from the AVM across all properties be equal to the average sales value of a property. In common parlance, an AVM is simply a mass appraisal—a technique both accepted and promoted by The Appraisal Foundation Board and described in the Uniform Standards of Professional Appraisal Practice (“USPAP”) guidelines. AVMs are used by UBS and by other major banks as a tool for investigating appraisals and the valuations of properties as part of due diligence. 2015 Report at ¶ 2 & n.1. AVMs are also commonly used in litigation for a variety of purposes. In many situations, it is acknowledged as one of the few tools that can be used to prove a claim made in litigation, including in toxic tort litigation, as I describe below.

15. There are a few different ways that an AVM can be conducted. In all methods that are used, there is a statistical analysis that forms the basis of the AVM. That statistical analysis assesses the relationship between sales prices for properties and characteristics of the property, including square footage of the structure, the age of the structure, the date of sale, and possibly

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<sup>5</sup> On page 19 of the Motion *In Limine* at footnote 12, UBS claims that “‘a host of discretionary judgments,’ which were made by Phoenix outside of Dr. Cowan’s supervision, mak[e] it impossible for UBS RESI or a factfinder to scrutinize whether those judgments were reasonable.” This is wrong. The analysis in this case is mine, not Phoenix’s, and the selection of the ten comparables is based on my procedures. All the judgments about the data to select and the analyses to conduct were thus mine, not Phoenix’s.

<sup>6</sup> Motion *In Limine*, page 21.

details like number of bedrooms, number of bathrooms, materials used in roof construction, whether the property is waterfront, etc.

16. As indicated above, AVMs are frequently used in cases involving claims of diminution of value because of a toxic spill, leak, or explosion. For example, in one case in which I constructed an AVM, the claim was made that an explosion at a phosphorus chemical plant in Tampa, Florida led to a diminution of value for all properties in a one-mile radius around the plant. In another such case, in Southern Illinois, the claim was diminution of value due to spills of gasoline from storage plants owned by Shell Oil. In another case for which I constructed an AVM, an unexploded bomb in a housing complex developed by several major developers was discovered close to a school that had lain undiscovered since bombing practice runs conducted during World War II.

17. In a similar way, AVMs are used as part of the analysis in disparate impact cases. When a city passes new regulations regarding zoning, construction of residential housing, or housing availability to people living in the city, there are sometimes lawsuits filed on behalf of minorities, seniors, and other protected classes that may be affected by the activities of the city. One of the key claims in these cases is that housing is not available to these groups, or that the stock of housing that is available is reduced through the city's actions. Frequently, part of the proof of these claims revolves around whether there is sufficient housing available for these groups, or whether the actions of the city make it impossible for people in these groups to find adequate housing. The AVM is used to examine the availability of housing at different pricing levels (set by HUD for each city) at the time the regulations are passed or actions are taken. If adequate housing is available in a city, then the actions of the city do not have a disparate impact.

#### **IV. There Was No “Change in Methodology” Between My 2014 And 2015 Reports**

18. UBS wrongly claims that I changed my methodology in my 2015 Report. My methodology did not change. In both reports, I determined the point in the AVM data that was most statistically appropriate for recalculating the properties’ LTV ratios, and then recalculated the ratios. Rather, the data changed because Lewtan, the AVM provider for my 2014 Report, declined to assist in my 2015 Report.

19. Therefore, for the 2015 Report, I performed my own analysis of data provided by Phoenix, which for simplicity’s sake I will call the “Phoenix AVM,” though, as I describe below, the AVM represents my own work. I was not and am not the “mouthpiece” for Phoenix, as UBS asserts. In reality, I only purchased data (through Quinn Emanuel) from Phoenix in order to obtain comparable properties to those being evaluated in the securitizations at issue. The specifications for the selection of the data that I purchased from Phoenix are my work. In particular, I gave Phoenix the methodology for selection of the data. I disclosed these specifications in my 2015 Report at ¶ 5.

20. Phoenix performed the calculations I specified on a large database it owns. The same data is available for purchase from Phoenix, including by UBS.

21. Moving from Lewtan to Phoenix made it possible for me to have all the data necessary to perform a number of different analyses that were not available from the Lewtan AVM. The Lewtan AVM is a regression model that produces an estimate of a sales price, plus a forecast standard deviation that is a summary statement about the relative reliability of the estimate. The Phoenix data is simply that—ten comparable properties with exact sales prices for the ten properties. 2015 Report at ¶ 6. Phoenix did not run a regression model, with the attendant estimate of a sales price or forecast standard deviation. The Phoenix data was produced to UBS in its entirety.

22. As I just noted, with different data from Phoenix, there are a number of more precise analyses that I can and did conduct. There are also other analyses that no longer have any meaning with the new data. UBS draws a false comparison between my 2014 Report and 2015 Report. I applied a different, additional set of tests to the Phoenix data because it was possible to make more precise statements about a set of data purposely chosen to be most comparable to the set of loans in the securitizations at issue. I describe these tests and why I conducted them in the next section.

#### **V. What I Did In This Case**

23. In Sections E and F of UBS's *Motion In Limine*, "Dr. Cowan's 2014 Report Based on Undisclosed Expert Lewtan's Work" and "Dr. Cowan's New Report Based Upon Undisclosed 'Expert' Phoenix's Work" there is a basic misunderstanding of what my 2014 Report does and why the 2015 Report does not reflect a change of opinion, but rather an expansion of an opinion based on new data.

24. The input data used by Lewtan and Phoenix is remarkably similar, as the data comes from a few basic sources, commonly used for AVMs. The primary data source is tax assessment databases obtained from the 3,000+ counties and parishes in the United States. These are the systems of record for all sales of residential properties, recording the sale, type of sale (warranted deed or other), date of sale, and characteristics of the property for use in assessing taxes. These systems also incorporate as many as four previous sales for a property, including the same metrics, so a history of sales for a property can also be constructed. The county tax records are the same systems I have used in the construction of approximately 20 AVMs for past toxic tort and disparate impact cases.

25. In terms of outputs, however, there are several differences between what Lewtan provided and what Phoenix provided. Lewtan uses a regression model. It predicts the mean



valuation of a property based on comparable sales using thousands or tens of thousands sales prices (the actual number depends on the part of the country) from other sales, and adjusted for differences between the properties based on features like square footage, age, and date of sale. I know this is the Lewtan model since I spoke with Lewtan analysts directly about how they do this and their sources of data. 2014 Report at ¶ 2.

26. Lewtan produces predictions of sales prices, using a well-known (and commonly accepted) statistical technique. With the prediction comes a range of predictions, computed as plus or minus a single forecast standard deviation around the predicted value. 2014 Report at ¶ 27. This forecast standard deviation is based on how well all of the predictions fit the actual sales values.

27. The description of the 68% confidence interval given by UBS in its motion is correct, but the only reason we know that the confidence interval contains 68% probability (of the true prediction falling into this range) is because we computed a mean prediction, and with a large enough number of observations that the Central Limit Theorem tells us that the mean is normally distributed. The prediction is the weighted average of thousands or tens of thousands of observations, so the Central Limit Theorem tells us we can compute this confidence interval. Statistically, then, the likelihood that the true value of the properties was higher than the 68% upper bound of the Lewtan data was only 16%, so I used the data on that bound to recalculate the LTV ratios.

28. The Phoenix output, by contrast, contains the ten sales properties that are most similar to the subject property, known as “comparables.” I know this because I am intimately familiar with Phoenix’s work. My work with Phoenix began well before they conducted any selection of properties. I met with them personally in New York, working with them on the equations used

for the determination of which properties were comparables. 2015 Report at ¶¶ 3-5. The methodology I gave them was based on two papers I wrote<sup>7</sup> and presented<sup>8</sup> in the late 1970s. These papers were also listed in my C.V., provided to UBS. 2015 Report Ex. 1 at 4.

29. The methodology applies a measure called a “Mahalanobis” distance to determine the mathematical distance between the subject property (the property that is collateral underlying the loan) and all the properties in the Phoenix database. 2015 Report at ¶ 5 & n.3. The mathematical distance includes the spatial distance calculated in feet, yards, miles, or any other metric one chooses. The mathematical distance also incorporates the numeric distance for the properties on other factors like square footage and age. The components of the distances are given equal weight and correlations between the factors are removed to give a true measure of the similarity of the properties both in space and also on several other characteristics. Examples of each are in Chart 1 below. The “Mahalanobis” distance is the only basis for the selection of comparables. It is an algorithm that is applied uniformly. There is no judgment applied, no subjective deliberation—simply the metric applied through a computer program, using a set of factors commonly known for all properties.

30. Phoenix does not make a prediction like the Lewtan AVM does. It selects the ten “closest” properties to the subject property, using the “Mahalanobis” distance metric as the sole criterion, and gives me the sales values for the “closest” properties. All Phoenix generates are ten properties that are the nearest comparables for each of the subject properties. 2015 Report at ¶¶ 5-6. The dataset I received from Phoenix was given to UBS. The exact dataset had thousands

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<sup>7</sup> Cowan, Charles D., and Spoeri, Randall K., “Statistical Distance Measures and Test Site Selection: Some Considerations”, Proceedings of the Computer Science and Statistics: Eleventh Annual Symposium on the Interface, 1978.

<sup>8</sup> Spoeri, Randall K., and Cowan, Charles D., “On the Use of Distance Measures in Test Site Selection: A Practical Application Using Census Data”, Proceedings of the American Statistical Association, Section on Business and Economic Statistics, 1978.

of lines, each line identifying the property from the securitization plus the ten comparables. I make it quite clear in my report that all the calculations on which I rely are mine.

31. Unlike the AVM output from Lewtan, using the Phoenix data I cannot calculate a forecast standard deviation nor can I rely on the approximation to the normal distribution as one can with a regression. With only ten observations, the Central Limit Theorem does not hold. The “Limit” part relies on a large number of observations. The probability distribution of differences on sales values between the subject property and the comparables approaches the normal distribution when there are many observations, not 10. Consequently, using the 68% upper bound would not have been statistically appropriate.

32. My analysis of the Phoenix output is mischaracterized as if there was only one piece to the analysis. I did an analysis to show that the appraisal is larger than 0, 1, 2, ... , 10 comparables from Phoenix. 2015 Report at ¶¶ 35-39. If the appraisal is equal to the AVM, there would only be a  $(0.5)^{11} < 0.1\%$ , not 68%, chance of any appraisal being bigger than all ten comparables. I test all the other points too. This information is presented in my report.

33. My analysis also included recalculated LTV values based on the mean of the ten comparable values and compared these to the LTV reported on the loan tapes, the maximum LTV values permitted under the underwriting guidelines, and the maximum LTV values permitted under the contracts at issue in this case. 2015 Report at ¶¶ 45-52. I note again that all of these calculations are mine, not the calculations of Phoenix.

34. I note that in my report that I state that “I conducted three tests”<sup>9</sup> and then go on to describe them as the sign test; a test of the appraisal value to all ten of the individual comparables individually, comparing the number of comparables exceeded to the appraisal; and then finally a 68% confidence interval on the mean of the ten values. 2015 Report at ¶¶ 33-44.

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<sup>9</sup> 2015 Report at ¶ 33.

Within the Motion *In Limine*, only the last of these tests is mentioned, even though it follows two other equally dispositive tests.

35. Each of the three tests shows that the appraisals are consistently higher than the AVM results in a way that is highly unlikely to be due to chance alone. The results of the first test—which compared the appraisal with the AVM value—show that, at 95% confidence, the AVM is lower than the reported appraisal 71.3% of the time, whereas one would expect differences between the two approximately 50% of the time if such differences were due to chance alone. *Id.* at ¶¶ 33-34, Tbl. 2. The second test compared the appraised value to each of the ten comparables. If the AVM and the appraisals differed by chance alone, one would expect that the appraisals to be higher than each comparable approximately 9% of the time. Instead, the appraisals exceeded the higher comparables considerably more frequently than the lower. In addition, the percentage of appraisals that exceeded the comparables increased as the value of the comparables increased. There is a less than a 0.1% probability of the latter result occurring by chance alone. I concluded that the results of the second test showed a consistent upward bias in the appraisals. *Id.* ¶¶ 35-39, Tbl. 3, Chart 1. The third test constructed a 68% confidence interval based on the ten comparables. I tested whether the distribution of results within the 68% confidence bound was consistent with chance assuming a normal distribution (although, as noted above, a normal distribution cannot be assumed when there are only ten data points). I found that in each case there were many more appraisal values above the 68% confidence bound than would be expected by chance—another indication of a significant upward bias in the appraisals. *Id.* ¶¶ 40-44, Tbl. 4. The results of each of these tests provides a statistically significant basis for the conclusion that the appraisals are inflated.

## VI. Reliance On Standards Established For AVMs

36. UBS also makes several incorrect claims concerning the standards governing the use of AVMs in appraisals. In UBS's Motion *In Limine*, the discussion regarding "governing law and ethics in the Appraisal Industry" on pages 3 and following is incorrect. As I show below, there is no "law" regarding the use of appraisals, nor are there formal federal regulations. UBS cites multiple sets of "guidelines," which are neither laws nor regulations. The statement that "federal laws and regulations set forth strict standards for industry use of AVMs" on page 3 is also incorrect.

37. The Interagency Appraisal and Evaluation Guidelines promulgated by FIRREA do not apply to this situation or me. The Guidelines themselves make clear that they apply to "federally regulated institutions and examiners" and that they "address supervisory matters relating to real estate appraisals and evaluations used to support real estate-related financial transactions." Fumerton Decl. Ex. Q (Dkt. 328-17). The Guidelines also expressly note: "Institutions may employ AVMs for a variety of uses such as loan underwriting and portfolio monitoring." *Id.*

38. UBS's citation to an "advisory opinion" from the Uniform Standards of Professional Appraisal Practice is similarly misleading. These are published by the Appraisal Foundation, which offers advisories for members of their body, which does not cover all appraisers and certainly not those practitioners who use AVMs. The statement that the USPAP standards are "the generally accepted standards governing appraisals" comes directly from the Appraisers Association of America website.<sup>10</sup> In short, the statement is nothing more than a trade association calling USPAP the generally accepted standards, and is not a statement from a federal agency or any other external governing body. This is something USPAP itself admits in

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<sup>10</sup> See Baldwin Decl. Ex. 26, <https://www.appraisersassociation.org/index.cfm?pageId=882>.

a statement not quoted by UBS: “USPAP does not establish who or which assignments must comply. Neither The Appraisal Foundation [creator of USPAP] nor its Appraisal Standards Board is a government entity with the power to make, judge, or enforce law.”<sup>11</sup>

39. Finally, in terms of training and background, USPAP has one standard, #6, on AVMs. It says nothing about how to do an AVM, but instead addresses the care that should be given.<sup>12</sup> The IAAO also has multiple standards, plus books published by the IAAO regarding AVMs<sup>13</sup> and several very specific standards regarding mass appraisals and how they are done. Neither sets a specific set of requirements.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 9<sup>th</sup> day of February, 2016 in New York, New York.

A handwritten signature in dark ink, reading "Charles D. Cowan". The signature is fluid and cursive, with a horizontal line underneath it.

Charles D. Cowan, Ph.D.

<sup>11</sup> See Baldwin Decl. Ex. 27, USPAP 2014-2015 Edition, The Appraisal Foundation, Page U-5, lines 189-190.

<sup>12</sup> See Baldwin Decl. Ex. 27, Standard 6, Pages U-37-47.

<sup>13</sup> See, e.g., Gloudenmans, Robert and Almy, Richard. Fundamentals of Mass Appraisal, IAAO, 2011 Mass Appraisal of Real Property.

**Chart 1: Distances: Spatial and Mathematical**

